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TABLE 5: SUMMARY OF CONTAMINANTS OF CONCERN IN DEEP SOIL (ZONE 2 LANDFILL AREA)

CONTAMINANTS OF CONCERN	AVERAGE CONCENTRATION (PPB)	MAXIMUM DETECTION (PPB)	FREQUENCY OF DETECTION
Arsenic	7093.1	71000.0	38/39
Benzo(a)anthracene	1005.9	3200.0	19/38
Benzo(b)fluoranthene	1384.3	8300.0	18/39
Chloroform	8.5	15.0	2/38
Chrysene	1124.9	34.00.0	21/38
Dibenzo(a,h)anthracene	247.5	1100.0	11/39
Dieldrin	1462.8	17000.0	17/33
Phthlate bis (2 ethylhexyl)	3132.2	41000.0	16/39
Tetrachloroethylene	2.5	3	2/49
Trichloroethylene	1207.7	51000.0	24/50
Barium	99859.9	964000.0	38/39
Copper	59167.6	452000.0	39/39
Cresol,p	7051.6	100000.0	10/39
Dichloroethylene 1,2-	82.5	980.0	11/50
Lead	82010.8	1380000.0	39/39
Nickel	19207.1	252000.0	31/39
Selenium	1752.5	2700.0	3/39
Zinc	108970.6	1900000.0	39/39

TABLE 5A:
CARCINOGENIC RISKS FOR CHILDREN EXPOSED TO DEEP SOILS
ZONE 2

CONTAMINANT OF CONCERN	CONCENTRATION (UG/1) AVG	MAX	CANCER POTENCY FACTOR MG/KG/d-1	RISK ESTIMATE AVG	RISK ESTIMATE MAX
Arsenic	7093.1	71000.0	1.75E+00	1E-07	2E-06
Benzo(a)anthracene	1005.9	3200.0	1.20E+01	3E-07	2E-06
Benzo(a)pyrene	1180.7	4500.0	1.20E+01	3E-07	2E-06
Benzo(b)fluoranthene	1384.3	8300.0	1.20E+01	4E-07	4E-06
Chloroform	8.5	15.0	6.10E-03	7E-12	2E-11
Dibenzo(a,h)anthracene	247.5	1100.0	1.20E+01	7E-08	6E-07
Dieldrin	1462.8	17000.0	1.60E+01	5E-07	1E-05
Phthalate,bis (2 ethylhexyl)	3132.2	41000.0	1.40E-02	1E-09	3E-08
Tetrachlorethylene	2.5	3.0	5.1E-02	2E-11	4E-11
Trichloroethylene	1207.7	51000.0	1.10E-02	2E-09	1E-07

TABLE 5B:
NONCARCINOGENIC RISKS FOR CHILDREN EXPOSED TO DEEP SOILS ZONE 2

CONTAMINANTS OF CONCERN	CONCENTRATION (UG/1) AVG	MAX	REFERENCE DOSE MG/KG/d	HAZARD INDEX AVG	MAX	TOXICITY ENDOPOINT
Arsenic	7093.1	71000.0	1.00E-03	5E-03	5E-02	Keratosis
Chloroform	8.5	15.0	1.00E-02	6E-05	1E-04	Liver lesions
Dieldrin	1462.8	17000.0	5.00E-05	4E-01	5E+00	Liver lesions
Phthalate,bis (2 ethylhexyl)	3132.2	41000.0	2.00E-02	2E-03	3E-02	Liver effects
Tetrachloroethylene	2.5	3.0	1.00E-02	2E-05	2E-05	Liver effects
Barium	99859.9	964000.0	5.00E-02	1E-02	1E-01	Increased BP
Copper	59167.6	452000.0	7.40E-05	8E-06	6E-05	GI distress
Cresol,p	7051.6	100000.0	5.00E-02	2E-03	3E-02	Reduced body wt.
1,2-Dichloro-ethylene	82.5	980.0	2.00E-02	6E-04	7E-03	Increased serum alkaline phos-phatase
Lead	82010.8	138000.0	5.70E-04	4E-02	7E-01	CNS effects
Nickel	19207.1	252000.0	2.00E-02	5E-03	6E-02	Reduced body wt.
Selenium	1752.5	2700.0	3.00E-03	1E-03	2E-03	Dermatitis
Zinc	108970.6	190000.0	2.00E-01	4E-03	7E-02	Anemia

Hazard Index Sums	Average	Reasonable Maximum Exposure
Liver Effects	4E-01	5E+00
Reduced Body Wt.	7E-03	9E-02
Keratosis	5E-03	5E-02
Increased BP	1E-02	1E-01
GI Distress	8E-06	6E-05
CNS Effects	4E-02	7E-01
Dermatitis	1E-03	2E-03
Anemia	4E-03	7E-02

TABLE 6:SUMMARY OF CONTAMINANTS OF CONCERN IN SHALLOW SOIL (ZONE 3 Other On Site Soil AREA)

CONTAMINANTS OF CONCERN	AVERAGE CONCENTRATION (PPB)	MAXIMUM DETECTION (PPB)	FREQUENCY OF DETECTION
Arsenic	4312.5	16000.0	16/21
Benzo(a)anthracene	850.2	4500.0	7/22
Benzo(a)pyrene	715.0	2900.0	7/22
Benzo(b)fluoranthene	1074.8	7500.0	9/22
Chloroform	27	27	1/37
Chrysene	659.9	3200.0	10/22
Dibenzo(a,h)anthracene	219.5	340.0	2/22
Phthalate,bis(2 ethyl-hexyl)	434.8	1600.0	7/20
Tetrachloroethylene	1.3	1.3	1/39
Trichloroethylene	11.6	32.0	9/40
Barium	245333.3	70000.0	20/22
Copper	24181.3	255000.0	21/21
Lead	102062.5	2340000.0	21/21
Nickel	9687.5	1600.0	6/21
Selenium	3123.0	3700.0	3/22
Zinc	32823.5	11600.0	22/22

TABLE 6A:
CARCINOGENIC RISKS FOR CHILDREN EXPOSED TO SHALLOW SOILS
ZONE 3

CONTAMINANT OF CONCERN	CONCENTRATION (UG/1) AVG	MAX	CANCER POTENCY FACTOR MG/KG/d-[1]	RISK ESTIMATE AVG	RISK ESTIMATE MAX
Arsenic	4312.5	16000.0	1.75E+00	6E-08	5E-07
Benzo(a)anthracene	850.2	450.0	1.20E+01	2E-07	2E-06
Benzo(a)pyrene	715.0	2900.0	1.20E+01	2E-07	2E-06
Benzo(b)fluoranthene	1074.8	7500.0	1.20E+01	2E-07	4E-06
Chloroform	27.0	27.0	6.10E-03	2E-11	4E-11
Chrysene	659.9	3200.0	1.20E+01	2E-07	2E-06
Dibenzo(a,h)anthracene	219.5	340.0	1.20E+01	6E-08	2E-07
Phthalate,bis (2 ethyl-hexyl)	434.8	1600.0	1.40E-02	1E-10	1E-09
Tetrachlorethylene	1.3	1.3	5.10E-02	8E-12	2E-11
Trichloroethylene	11.6	32.0	1.10E-02	2E-11	9E-11

TABLE 6B:
NONCARCINOGENIC RISKS FOR CHILDREN EXPOSED TO SHALLOW SOILS ZONE 3

CONTAMINANTS OF CONCERN	CONCENTRATION (UG/1) AVG	MAX	REFERENCE DOSE MG/KG/d	HAZARD INDEX AVG	MAX	TOXICITY ENDOPOINT
Arsenic	4312.5	16000.0	1.00E-03	3E-03	1E-02	Keratosis
Chloroform	27.0	27.0	1.00E-02	2E-04	2E-04	Liver lesions
Phthalate,bis (ethylhexyl)	434.8	1600.0	2.00E-02	3E-04	1E-03	Liver effects
Tetrachloro-ethylene	1.3	1.3	1.00E-02	1E-05	1E-05	Liver effects
Barium	24533.3	70000.0	5.00E-02	2E-03	7E-03	Increased BP
Copper	24181.3	255000.0	7.40E-05	3E-06	3E-05	GI Distress
Lead	102062.5	2340000.0	5.70-04	5E-02	1E+00	CNS effects
Nickel	9687.5	16000.0	2.00E-02	2E-03	4E-03	Reduced body wt.
Selenium	3125.0	3700.0	3.00E-03	2E-03	3E-03	Dermatitis
Zinc	32823.5	116000.0	2.00E-01	1E-03	4E-03	Anemia

Hazard Index Sums	**Average**	**Reasonable Maximum Exposure**
Liver Effects	5E-04	1E-03
Keratosis	3E-03	1E-02
Increased BP	2E-03	7E-03
GI Distress	3E-06	3E-05
CNS Effects	5E-02	1E+00
Reduced body wt.	2E-03	4E-03
Dermatitis	2E-03	3E-03
Anemia	1E-03	4E-03

TABLE 7: SUMMARY OF CONTAMINANTS OF CONCERN IN SEDIMENT (ZONE 6 DOWNSTREAM)

CONTAMINANTS OF CONCERN	AVERAGE CONCENTRATION (PPB)	MAXIMUM DETECTION (PPB)	FREQUENCY OF DETECTION
Arsenic	1865.7	6200.0	8/10
Benzo(a)anthracene	2130.0	10070	13/16
Benzo(a)pyrene	2071.0	9160.0	12/16
Benzo(b)fluoranthene	1422.2	6500.0	10/16
Chloroform	110.5	202.0	2/15
Chrysene	2193.2	7860.0	14/16
Dibenzo(a,h)anthracene	505.0	1470.0	4/16
Dichloroethylene 1,1-	740.0	740.0	1/17
Dieldrin	425.7	1700.0	5/15
Trichloroethylene	129.1	920.0	9/17
Vinyl Chloride	170.5	290.0	2/17
Barium	33810.0	174000.0	12/13
Copper	27768.8	93000.0	10/10
Dichloroethylenes 1,2	114.2	230.0	7/17
Lead	27862.5	56000.0	10/10
Nickel	6225.0	9300.0	9/10
Zinc	90045.0	544000.0	13/13

TABLE 7A:
CARCINOGENIC RISKS FOR ADULTS EXPOSED TO SIDEMENTS VIA RISK (ZONE 6) DOWNSTREAM OF SITE

CONTAMINANT OF CONCERN	CONCENTRATION (UG/1) AVG	MAX	CANCER POTENCY FACTOR MG/KG/d-^{1}	RISK ESTIMATE AVG	RISK ESTIMATE MAX
Benzo(a)anthracene	2130.0	10070.0	1.20E+01	2E-03	9E-03
Benzo(a)pyrene	2071.0	9160.0	1.20E+01	2E-03	8E-03
Benzo(b)fluoranthene	1422.2	6500.0	1.20E+01	1E-03	6E-03
Chloroform	110.5	202.0	6.10E-03	5E-08	9E-08
Chrysene	2193.2	7860.0	1.20E+01	2E-03	7E-03
Dibenzo(a,h)anthracene	505.0	1470.0	1.20E+01	4E-04	1E-03
Dichloroethylene - 1,1	740.0	740.0	6.00E-01	3E-05	3E-05
Dieldrin	425.7	1700.0	1.60E+01	5E-04	2E-03
Trichloroethylene	129.1	920.0	1.10E-02	1E-07	7E-07
Vinyl chloride	170.5	290.0	2.30E+00	3E-05	5E-05

TABLE 7B:
NONCARCINOGENIC RISKS FOR ADULTS EXPOSED TO FISH VIA SEDIMENTS

CONTAMINANTS OF CONCERN	CONCENTRATION (UG/1) AVG	CONCENTRATION (UG/1) MAX	REFERENCE DOSE MG/KG/d	HAZARD INDEX AVG	HAZARD INDEX MAX	TOXICITY ENDOPOINT
Chloroform	110.5	202.0	1.00E-02	8E-04	1E-03	Liver Lesions
Dichloro-ethylene,1,1	740.0	740.0	9.00E-03	6E-03	6E-03	Liver Lesions
Dieldrin	425.7	1700.0	5.00E-05	6E-01	2E+00	Liver Lesions
Dichloro-ethylene 1,2	114.2	230.0	2.00E-02	8E-04	2E-03	Lung & Liver

Hazard Index Sums	Average	Reasonable Maximum Exposure
Liver Effects	6E-01	2E+00

TABLE 8: SUMMARY OF CONTAMINANTS OF CONCERN IN SEDIMENT (ZONE 8 UPSTREAM OF SITE)

CONTAMINANTS OF CONCERN	AVERAGE CONCENTRATION (PPB)	MAXIMUM DETECTION (PPB)	FREQUENCY OF DETECTION
Arsenic	910	910	1/5
Benzo(a)anthracene	898.3	1000.0	4/5
Benzo(a)pyrene	1000.0	1000.0	3/5
Benzo(b)fluoranthene	1100.0	1400.0	3/5
Chrysene	1225.0	1400.0	3/5
Pthalate,bis(2 ethyl hexyl	510.0	600.0	2/4
Barium	20400.0	21300.0	3/5
Copper	32075.0	54000.0	5/5
Lead	54275.0	79000.0	5/5
Nickel	7450.0	7700.0	3/5
Selenium	740.0	800.0	2/5
Zinc	94625.0	118000.0	5/5

TABLE 8A:
CARCINOGENIC RISKS FOR ADULTS EXPOSED TO SEDIMENTS VIA FISH (ZONE 8) UPSTREAM OF SITE

CONTAMINANT OF CONCERN	CONCENTRATION (UG/1) AVG	MAX	CANCER POTENCY FACTOR MG/KG/d-^{1}	RISK ESTIMATE AVG	RISK ESTIMATE MAX
Benzo(a)anthracene	898.3	1000.0	1.20E+01	8E-04	9E-04
Benzo(a)pyrene	1000.0	1000.0	1.20E+01	9E-04	9E-04
Benzo(b)fluoranthene	1100.0	1400.0	1.20E+01	9E-04	1E-03
Chrysene	1225.0	1400.0	1.20E+01	1E-03	1E-03
Phthalate-bis(2 ethyl-hexyl)	510.0	600.0	1.40E-02	5E-07	6E-07

TABLE 8B
NONCARCINOGENIC RISKS FOR ADULTS EXPOSED TO SEDIMENTS VIA FISH ZONE 8

CONTAMINANTS OF CONCERN	CONCENTRATION (UG/1) AVG	MAX	REFERENCE DOSE MG/KG/d	HAZARD INDEX AVG	MAX	TOXICITY ENDOPOINT
Phthalate - bis (2 ethylhexyl)	510.0	600.0	2.00E-02	2E-03	2E-03	Liver effects

Hazard Index Sums	Average	Reasonable Maximum Exposure
Liver effects	2E-03	2E-03

TABLE 9

SUMMARY OF POTENTIAL CHEMICAL SPECIFIC ARARS WITH RESPECT TO STAMINA MILLS SITE

REQUIREMENTS	STATUS	REQUIREMENT SYSOPSIS	APPLICATION TO THE RI/FS
FEDERAL REQUIREMENTS			
RCRA Maximum Concentration Limits 40 CFR 264 Subpart F	Applicable	MCLs have been established for 14 toxic compounds under RCRA groundwater protection standards. A compliance monitoring program is included for RCRA facilities.	Pertains to identified hazardous materials that are treated, stored, or disposed on-site
Safe Drinking Water Act Maximum Contaminant Levels (MCLs) 40 CFR 141.11 - 141.16	Relevant and Appropriate	MCLs have been set for toxic compounds as enforceable standards for public drinking water systems. SMCLs are unenforceable goals regulating the asthetic quality of drinking water.	Aquifer below the Stamina Mills site is a source of drinking water. Some contaminants in plume below site are above MCLs and SMCLs.
Safe Drinking Water Act Maximum Contaminant Levels Goals (MCLGs) 40 CFR 141.50 - 141.51	Relevant and Appropriate	MCLGs are unenforceable goals under the SDWA.	Aquifer below the Stamina Mills site is a source of drinking water. Some contaminants in plume below site are above MCLGs.
Clean Water Act Federal Water Quality Criteria 51 Federal Register 43665	Relevant and Appropriate	Effluent limitations must meet BAT. Water Quality Criteria for ambient water quality are provided for toxic chemicals.	Current discharges from site may cause degredation of Branch River in excess of AWQCs. Discharges to the Branch River associated with groundwater remediation or other activities would have AWQCs as potential goal.
STATE REQUIREMENTS			
R.I. Rules and Regulations Pertaining to Public Drinking Water R46-13-DWS, Amended January, 1983	Relevant and Appropriate	Establishes MCLs, limits, and requirements for current and future public water supply systems.	Aquifer below site is source of drinking water but not a current public water supply.

TABLE 9

SUMMARY OF POTENTIAL CHEMICAL SPECIFIC ARARS WITH RESPECT TO STAMINA MILLS SITE

REQUIREMENTS	STATUS	REQUIREMENT SYSOPSIS	APPLICATION TO THE RI/FS
R.I. Water Quality Regulations for Water Pollution Control RI GL 46-12, 42-17.1, 42-35	Applicable	Provides water classification for surface waters in R.I. Sets effluent limitations and RIPDES Permit requirements for discharges to the waters.	Branch River classified as B; present condition C. Effluents to Branch River from site must meet requirements for class B.
Regulations for the R.I. Pollutant Discharge Elimination System (RIPDES) R.I.G.L. 46-12, 42-17, 42-35	Applicable	Sets forth the requirements and applicability for the RIPDES Permit for discharge to State Waters.	Discharges associated with groundwater treatment or other remedial activities to off-site outfalls to Branch River would require RIPDES permit, on-site outfall would be required to meet substantive requirements but would not need a permit.
Draft Groundwater Classification under the R.I. Groundwater protection ACT R.I.G.L. 46-13.1	To Be Considered	Classification for R.I. groundwater. Four classes of water are designated according to suitability for use as a drinking water source.	The Stamina Mills Site groundwater is preliminarily designated as GAA, "... suitable for drinking water use without treatment". Standards for Class GAA are federal MCLs and applicable state limits.
R.I. Air Pollution Control Regulations Regulations No. 22, Air Toxics RI GL 23-23, 42-35	Applicable	Stationary air emission sources generating listed toxic substances shall not exceed given concentrations of toxics at or beyond property	On-site remediation may include the use of technologies that would produce air emissions.

TABLE 10

SUMMARY OF POTENTIAL LOCATION SPECIFIC ARARS WITH RESPECT TO STAMINA MILLS SITE

REQUIREMENTS	STATUS	REQUIREMENT SYSOPSIS	APPLICATION TO THE RI/FS
FEDERAL REQUIREMENTS			
RCRA Location Requirements 40 CFR 264.18(c)	Relevant and Appropriate	Sets forth minimum requirements for design, construction, and operation of a facility where treatment, storage, or disposal of hazardous waste will be located within a 100-year floodplain.	Treatment, disposal, and storage of hazardous materials may take place during remediation of the site. Some wastes are located within the 100-year floodplain.
National Historic Preservation Act of 1966. 16 U.S.C. 470 et seq. 36 CFR Part 800	Not ARAR	Requires that the action not effect or cause harm to registered Historic Places or Historic Landmarks.	**None of the alternatives would have an adverse effect on the Forestdale Historic District**
Endangered Species Act 16 U.S.C. 1531 et seq. 50 CFR Part 402	Not ARAR	Action must avoid jeopardizing the continued existence of listed endangered or threatened species or modification of their habitat.	No endangered species or habitats are in existance on-site.
Coastal Zone Management Act 16 U.S.C 1451 et seq. 15 CFR Part 930	Not ARAR	Activities affecting land or water uses in a coastal zone required to certify noninterference with coastal zone management.	Site not located on or near coastal zone.
Fish and Wildlife Coordination Act 16 U.S.C. 661 et seq.	Applicable	Requires actions to protect fish and wildlife from actions modifying streams or areas affecting streams.	On-site remediation activities may include modifications to the Branch River adjacent to the site.
Clean Water Act, Section 404 Pertaining to Wetlands 33 U.S.C. 1251 et seq.	Relevant and Appropriate	Prohibits discharge of dredged or fill material into navigable waters without a permit.	On-site remediation activities may include discharge of dredge or fill material into the Branch River. On-site activities do not require permitting, but substantive

TABLE 10

SUMMARY OF POTENTIAL LOCATION SPECIFIC ARARS WITH RESPECT TO STAMINA MILLS SITE

REQUIREMENTS	STATUS	REQUIREMENT SYSOPSIS	APPLICATION TO THE RI/FS
			portion must be met.
Executive Order 11990 Wetlands Protection Policy	To be considered	Sets forth policy for the protection of wetlands.	To the extent that the Executive Order provides additional guidance to State requirements for wetland activities, they will be considered
Executive Order 11988 Floodplain Management Policy	To be considered	Sets forth policy for the protection of floodplains.	A portion of the site is located in a 100 year floodplain; however, Executive Order sets forth policy and is not enforceable.
STATE REQUIREMENTS			
State of Rhode Island DEM Rules and Regulations Governing the Enforcement of the Fresh Water Wetlands Act RI GL 2-1-18 - 27	Applicable	Sets forth requirements for the approval of permits for the alteration of freshwater wetlands.	The majority of the Stamina Mills site is located in an area designated as a freshwater wetlands under the R.I. definition.

TABLE 11

SUMMARY OF POTENTIAL ACTION SPECIFIC ARARS WITH RESPECT TO STAMINA MILLS SITE

REQUIREMENTS	STATUS	REQUIREMENT SYSOPSIS	APPLICATION TO THE RI/FS
FEDERAL ENVIRONMENTAL ARARS			
RCRA Identification of Hazardous Waste 40 CFR 261	Applicable	Criteria for identifying those solid wastes subject to regulation as hazardous substances under RCRA.	Suspected hazardous wastes on the Stamina Mills site should be identified as RCRA hazardous substances or non-hazardous substances prior to remedial activities. Jurisdiction is under R.I. RCRA program.
RCRA Identification of Hazardous Waste 40 CFR 261.33(d)	Applicable	A material is hazardous waste if it is a residue or contaminated soil, water or other debris resulting from the cleanup of a spill into or on any land or water of any commercial chemical product or manufacturing chemical intermediate having the generic name listed in the section.	Soils and groundwater on the Stamin Mills site are a result of a spill of Trichloroethene, a listed chemical in the section. Jurisdiction is under R.I. RCRA program.
RCRA Facility Standards, Preparedness and Prevention, Contingency Plan and Emergency Procedures 40 CFR 264, Subparts B, C, D	Applicable	Establishes minimum standards for the acceptable management of RCRA hazardous wastes. Includes preparedness and prevention measures, general facility standards, and contingency and emergency procedures.	Treatment, storage, and/or disposal of RCRA hazardous wastes may occur on the Stamina Mills site during remediation. Jurisdiction is under R.I. RCRA program.
RCRA Manifest System, Recordkeeping, and Reporting 40 CFR 264 Subpart E	Applicable	Establishes the rules and recordkeeping requirements for off-site transportation of RCRA hazardous materials for treatment and/or disposal.	Off-site transportation of RCRA hazardous wastes for treatment and/or disposal may be included in the site remediation. Jurisdiction is under R.I. RCRA program.
RCRA Groundwater Monitoring Requirements 40 CFR Subpart F	Applicable	Establishes minimum requirements for groundwater monitoring and protection standards for RCRA facilities.	On-site treatment, storage, and/or disposal of RCRA wastes may be included in the remediation of the Stamina Mills site. Jurisdiction is under R.I. program.

TABLE 11

SUMMARY OF POTENTIAL ACTION SPECIFIC ARARS WITH RESPECT TO STAMINA MILLS SITE

REQUIREMENTS	STATUS	REQUIREMENT SYSOPSIS	APPLICATION TO THE RI/FS
RCRA Closure and Post Closure Requirements 40 CFR 264 Subpart G	Applicable	Establishes minimum requirements for closure and post-closure care of a RCRA facility engaging in treatment, storage, and/or disposal of hazardous wastes. Closure requirements include in-place wastes and remediated areas.	At the conclusion of a remedial action involving the treatment, storage, disposal, removal of hazardous wastes, closure procedures and post-closure care would be required. Jurisdiction is under R.I. program.
RCRA Storage Requirements 40 CFR 264 Subparts I, J, and L	Applicable	Establishes minimum requirements for the storage of hazardous wastes.	RCRA hazardous waste may be stored on-site prior to off-site disposal or on-site treatment. Jurisdiction is under R.I. RCRA program.
RCRA Landfill Requirements 40 CFR 264 Subpart N	Relevant and Appropriate	Establishes minimum requirements for the design and construction, operation and maintenance, monitoring and inspection, closure and post closure care for a hazardous waste landfill.	RCRA hazardous waste may be landfilled on-site. Jurisdiction is under R.I. RCRA program.
RCRA Treatment Requirements 40 CFR 264 Subparts O and X	Applicable	Establishes minimum requirements for the permit approval, operation, and standards for incineration and other treatment for hazardous wastes.	Remediation may include incineration and/or treatment of hazardous wastes.
RCRA Land Disposal Restrictions 40 CFR 268	Relevant and Appropriate	Certain classes of waste are restricted from land disposal without acceptable treatment.	Removal of soils and other solvent- containing materials from the Stamina Mills site for land disposal may trigger the regulation after its effective date for CERCLA wastes on 11/8/90.
Clean Water Act Discharge Limitations- NPDES Permit 40 CFR 122, 125, 129, 136	Applicable	Prohibits unpermitted discharge of any pollutant or combintaion of pollutants to waters of the U.S. from any point source. Standards and limitations are established for these discharges.	Remedial actions may include the discharge of treated groundwater, runoff, or other flows.

TABLE 11

SUMMARY OF POTENTIAL ACTION SPECIFIC ARARS WITH RESPECT TO STAMINA MILLS SITE

REQUIREMENTS	STATUS	REQUIREMENT SYSOPSIS	APPLICATION TO THE RI/FS
Clean Water Act Wetlands Regulations, Part 404 40 CFR 230	Relevant and Appropriate	Controls the discharge of dredged or fill materials into waters of the U.S. such that the physical and biological integrity is maintained.	Remedial actions may occur along the Branch River.
Executive Order 11990 Wetlands Protection Policy	Not ARAR	Establishes guidelines for identification and protection of wetlands.	No wetlands defined by these guidelines are present on the Stamina Mills site.
Executive Order 11988 Floodplain Management Policy	To Be Considered	Establishes guidelines for activities conducted within a 100-year floodplain.	A small portion of the site is located within a 100-year floodplain.
Safe Drinking Water Act Underground Injection Control Program 40 CFR 144	Applicable	Regulates the use of five classes of underground injection wells for the purpose of disposal of hazardous substances.	**Remediation of the Stamina Mills site may include the subsurface discharge of treated groundwater**
Clean Air Act New Source Performance Standards, Section 111 40 CFR 60.	Applicable	Establishes standards of performance for new air emission sources.	Remedial actions may include technologies that have air emissions.
National Emission Standards for Hazardous Air Pollutants 40 CFR 161	Applicable	Establishes emissions standards, monitoring and testing requirements, and reporting requirements for 8 pollutants in air emissions.	One or more of the listed pollutants may be released via air emissions during site remediation.
Department of Transportation rules for the transport of hazardous substances 49 CFR	Applicable	Regulates the labelling, packaging, placarding, and transportation of solid and hazardous wastes off-site.	Remedial actions may include the off-site transport and disposal of solid and hazardous wastes.

TABLE 11
SUMMARY OF POTENTIAL ACTION SPECIFIC ARARS WITH RESPECT TO STAMINA MILLS SITE

REQUIREMENTS	STATUS	REQUIREMENT SYSOPSIS	APPLICATION TO THE RI/FS
Occupational Safety and Health Standards, 29 CFR 1910.120 for Hazardous Waste Operations and Emergengy Responses, Part 1926 for General Safety and Health Standards, and Reporting Requirements	Applicable	Sets limits on exposure to workers on hazardous site or emergency responses, sets forth minimum health and safety requirements such as personal protection and training, and reporting requirements.	All activities taking place on the Stamina Mills site including remediation, construction, and monitoring are subject to OSHA health and Safety regulations.
STATE OF RHODE ISLAND ENVIRONMENTAL ARARS			
R.I. Rules and Regulations for Hazardous Waste Generation, Transportation, Storage and Disposal R.I.G.L. 23-19-1 - 10	Applicable	Establishes minimum requirements for the generation, transportation, storage, treatment, and disposal of hazardous wastes.	On 01/31/1986 R.I. was granted authority to administer the state rules and regulations for hazardous waste generation, transportation, treatment, storage, and disposal. Remediation at the Stamina Mills site will include some of these activities.
R.I. Rules and Regulations for Solid Waste Management Facilities R.I.G.L. 23-18.9, 23-19, 42-17.1	Applicable	Establishes minimum requirements for the operation of solid waste management facilities and the specifications for design and construction of new facilities.	Remediation of the Stamina Mills site may include the management of solid waste.
R.I. Underground Injection Control Program R.I.G.L. 42-17.1, 46-12	Applicable	Establishes the minimum requirements for the location, design, construction, maintenance and operation of injection wells and other subsurface disposal systems to prevent groundwater	Remediation of the Stamina Mills site may include the subsurface discharge of treated groundwater.
R.I. Water Quality Regulations for Water Pollution control R.I.G.L. 46-12, 42-17.1, 42-35	Applicable	Classifies surface waters in R.I., and limits discharges to such waters.	Remediation of the Stamina Mills site may include a surface water discharge.

TABLE 11

SUMMARY OF POTENTIAL ACTION SPECIFIC ARARS WITH RESPECT TO STAMINA MILLS SITE

REQUIREMENTS	STATUS	REQUIREMENT SYSOPSIS	APPLICATION TO THE RI/FS
R.I. Pollutant Discharge Eimination System (RIPDES) R.I.G.L. 46-12, 42-17.1, 42-35	Applicable	Establishes the requirements for the approval of a RIPDES surface water discharge permit.	Remediation of the Stamina Mills site may include a surface water discharge.
R.I. Pretreatment Regulations R.I.G.L. 46-12,42-17.1, 42-45	Applicable	Controls the pollutants which pass through or interfere with treatment processes in POTW or which may contaminate sewage sludge.	Remediation of the Stamina Mills site may include discharge to the Woonsocket POTW.
R.I. Air Pollution Control Regulations: No.1 Visable Emissions	Applicable	No person shall emit into the atomosphere from any source any air contaminant for a period or periods aggregating more than 3 minutes in any 1 hour which is greater than or equal to 20% opacity.	Remediation of the Stamina Mills site may include air emissions.
No.5 Fugitive Dust	Applicable	Reasonable precautions shall be taken to prevent particulate matter from becoming airborne during materials handling, storage, building construction, demolition.	Remediation of the Stamina Mills site may include materials handling, construction, and demolition.
No.7 Emission of Air Contaminants Detrimental to Person or Property	Applicable	No person shall emit any contaminant which, either alone, or in combination with other contaminants, by reason of their concentration and duration, may be injurous to human, plant, or animal life, or cause damage to property or which unreasonably interferes with the enjoyment of life and property.	Air emissions may be produced during the remediation of the Stamina Mills site.
No.9 Approval to Construct, Install, Modify, or Operate	Applicable	Establishes the minimum criteria for and procedure in obtaining approval to install, modify, or operate an emission source.	Remedial actions at the Stamina Mills site may include the installation and operation of remedial equipment which may be a potential air emission source.

TABLE 11

SUMMARY OF POTENTIAL ACTION SPECIFIC ARARS WITH RESPECT TO STAMINA MILLS SITE

REQUIREMENTS	STATUS	REQUIREMENT SYSOPSIS	APPLICATION TO THE RI/FS
No.14 Record Keeping and Reporting	Applicable	The owner or operator of any source of air contaminants shall provide operational data on the air emission source.	Remedial actions at the Stamina Mills site may include air emissions and pollution control equipment.
No.15 Control of Organic Solvent Emissions	Not ARAR	Regulates emissions from installations using organic solvents or VOCs.	The Stamina Mills site would not be categorized as an installation using solvents or VOCs.
No.16 Operation of Air Pollution Control Systems	Applicable	Requires that any air pollution control system shall be operated according to the design specifications whenever the source on which it is installed is in operation or is emitting air contaminants.	Air pollution control systems may be used during remediation of the Stamina Mills site.
No.17 Odors	Applicable	Restricts emissions of any air contaminant or combination of contaminants which create an objectionable odor beyond the property line.	Remedial activities on the Stamina Mill site may cause a release of objectionable odors, such as disturbance of the landfill area.
No.22 Air Toxics	Applicable	Air emission limits are established for any stationary source using or generating a listed toxic substance.	Remedial activities may include the potential for release of listed toxics.
Division of Air and Hazardous Materials Policy on Permitting Air Strippers, April 20, 1989	To be considered	Establishes submittal policy prior to the installation of an air stripper.	Remedial actions may include the installation of an air stripper.

TABLE 12

ATTAINMENT OF POTENTIAL CHEMICAL SPECIFIC ARARS WITH RESPECT TO ALTERNATIVES

REQUIREMENTS Y = WILL BE ATTAINED N = WILL NOT BE ATTAINED	ON-SITE GROUNDWATER REMEDIAL UNIT				TCE SPILL AREA REMEDIAL UNIT			LANDFILL AREA REMEDIAL UNIT			OVERALL SITE REMEDIAL UNIT		
	GW-1	GW-2	GW-4	GW-5	TSA-1	TSA-3	TSA-4	LA-1	LA-3	LA-5	OS-3	OS-4	OS-5
FEDERAL REQUIREMENTS													
RCRA Maximum Concentration Limits 40 CFR 264 Subpart F					Y	Y							
Safe Drinking Water Act Maximum Contaminant Levels (MCLs) 40 CFR 141.11 - 141.16	Y	Y	Y	N	Y	Y	N						
Safe Drinking Water Act Maximum Contaminant Levels Goals (MCLGs) 40 CFR 141.50 - 141.51	Y	Y	Y	N	Y	Y	N						
Clean Water Act Federal Water Quality Criteria 51 Federal Register 43665	Y	Y	Y		Y	Y					Y	Y	N
STATE REQUIREMENTS													
R.I. Rules and Regulations Pertaining to Public Drinking Water R46-13-DWS, Amended January, 1983	Y	Y	Y	N	Y	Y	N						
R.I. Water Quality Regulations for Water Pollution Control RI GL 46-12, 42-17.1, 42-35	Y	Y	Y		Y	Y		Y	Y	N	Y	Y	N
Regulations for the R.I. Pollutant Discharge Elimination System (RIPDES) R.I.G.L. 46-12, 42-17, 42-35					Y	Y	Y	Y	Y	Y	Y	Y	
Draft Groundwater Classification under the R.I. Groundwater protection ACT R.I.G.L. 46-13.1	Y	Y	Y	N	Y	Y	Y	Y	Y	Y			
R.I. Air Pollution Control Regulations Regulations No. 22, Air Toxics RI GL 23-23, 42-35	Y				Y	Y		Y					

TABLE 13

ATTAINMENT OF POTENTIAL LOCATION SPECIFIC ARARS WITH RESPECT TO REMEDIAL UNITS

REQUIREMENTS Y = WILL BE ATTAINED N = WILL NOT BE ATTAINED	ON-SITE GROUNDWATER REMEDIAL UNIT				TCE SPILL AREA REMEDIAL UNIT			LANDFILL AREA REMEDIAL UNIT			OVERALL SITE REMEDIAL UNIT		
	GW-1	GW-2	GW-4	GW-5	TSA-1	TSA-3	TSA-4	LA-1	LA-3	LA-5	OS-3	OS-4	OS-5
FEDERAL REQUIREMENTS													
RCRA Location Requirements 40 CFR 264.18(c)	Y	Y	Y		Y	Y		Y					
National Historic Preservation Act of 1966. 16 U.S.C. 470 et seq. 36 CFR Part 800													
Endangered Species Act 16 U.S.C. 1531 et seq. 50 CFR Part 402													
Coastal Zone Management Act 16 U.S.C 1451 et seq. 15 CFR Part 930													
Fish and Wildlife Coordination Act 16 U.S.C. 661 et seq.													
Clean Water Act, Section 404 Pertaining to Wetlands 33 U.S.C. 1251 et seq.											Y	Y	
Executive Order 11990 Wetlands Protection Policy													
Executive Order 11988 Floodplain Management Policy					Y	Y	Y	Y	Y		Y	Y	
STATE REQUIREMENTS													
State of Rhode Island DEM Rules and Regulations Governing the Enforcement of the Fresh Water Wetlands Act RI GL 2-1-18 - 27	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	

TABLE 14

ATTAINMENT OF POTENTIAL ACTION SPECIFIC ARARS WITH RESPECT TO ALTERNATIVES

REQUIREMENTS Y = WILL BE ATTAINED N = WILL NOT BE ATTAINED	ON-SITE GROUNDWATER REMEDIAL UNIT				TCE SPILL AREA REMEDIAL UNIT			LANDFILL AREA REMEDIAL UNIT			OVERALL SITE REMEDIAL UNIT		
	GW-1	GW-2	GW-4	GW-5	TSA-1	TSA-3	TSA-4	LA-1	LA-3	LA-5	OS-3	OS-4	OS-5
FEDERAL REQUIREMENTS													
RCRA Identification of Hazardous Waste 40 CFR 261	Y	Y			Y	Y		Y			Y	Y	
RCRA Facility Standards, Preparedness and Prevention, Contingency Plan and Emergency Procedures 40 CFR 264, Subparts B, C, D	Y	Y	Y		Y	Y		Y					
RCRA Manifest System, Recordkeeping, and Reporting 40 CFR 264 Subpart E	Y	Y			Y	Y		Y			Y	Y	
RCRA Groundwater Monitoring Requirements 40 CFR Subpart F					Y	Y	Y	Y	Y	N			
RCRA Closure and Post Closure Requirements 40 CFR 264 Subpart G					Y	Y		Y	Y				
RCRA Storage Requirements 40 CFR 264 Subparts I, J, and L					Y			Y				Y	
RCRA Landfill Requirements 40 CFR 264 Subpart N					Y			Y	Y				
RCRA Treatment Requirements 40 CFR 264 Subparts O and X					Y			Y				Y	
RCRA Land Disposal Restrictions 40 CFR 268					Y			Y				Y	
Clean Water Act Discharge Limitations- NPDES Permit 40 CFR 122, 125, 129, 136					Y	Y		Y	Y				
Clean Water Act Wetlands Regulations, Part 404 40 CFR 230													
Executive Order 11990 Wetlands Protection Policy											Y	Y	
Executive Order 11988 Floodplain Management Policy					Y	Y	Y	Y	Y		Y	Y	

TABLE 14

ATTAINMENT OF POTENTIAL ACTION SPECIFIC ARARS WITH RESPECT TO ALTERNATIVES

REQUIREMENTS Y = WILL BE ATTAINED N = WILL NOT BE ATTAINED	ON-SITE GROUNDWATER REMEDIAL UNIT				TCE SPILL AREA REMEDIAL UNIT			LANDFILL AREA REMEDIAL UNIT			OVERALL SITE REMEDIAL UNIT		
	GW-1	GW-2	GW-4	GW-5	TSA-1	TSA-3	TSA-4	LA-1	LA-3	LA-5	OS-3	OS-4	OS-5
Safe Drinking Water Act Underground Injection Control Program 40 CFR 144													
Clean Air Act New Source Performance Standards, Section 111 40 CFR 60.	Y				Y			Y					
National Emission Standards for Hazardous Air Pollutants 40 CFR 161	Y				Y	Y		Y					
Department of Transportation rules for the transport of hazardous substances 49 CFR	Y	Y			Y	Y		Y			Y	Y	
Occupational Safety and Health Standards 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Occupational Safety and Health Standards 29 CFR Part 1926 Safety and Health Standards	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	
Occupational Safety and Health Reporting and Related Regulations	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
STATE REQUIREMENTS													
R.I. Rules and Regulations for Hazardous Waste Generation, Transportation, Storage and Disposal R.I.G.L. 23-19-1 - 10	Y	Y			Y	Y		Y			Y	Y	
R.I. Rules and Regulations for Solid Waste Management Facilities R.I.G.L. 23-18.9, 23-19, 42-17.1					Y			Y	Y	Y	Y	Y	
R.I. Underground Injection Control Program R.I.G.L. 42-17.1, 46-12	Y	Y	Y										
R.I. Water Quality Regulations for Water Pollution control R.I.G.L. 46-12, 42-17.1, 42-35					Y			Y	Y		Y	Y	

TABLE 14

ATTAINMENT OF POTENTIAL ACTION SPECIFIC ARARS WITH RESPECT TO ALTERNATIVES

REQUIREMENTS Y = WILL BE ATTAINED N = WILL NOT BE ATTAINED	ON-SITE GROUNDWATER REMEDIAL UNIT				TCE SPILL AREA REMEDIAL UNIT			LANDFILL AREA REMEDIAL UNIT			OVERALL SITE REMEDIAL UNIT		
	GW-1	GW-2	GW-4	GW-5	TSA-1	TSA-3	TSA-4	LA-1	LA-3	LA-5	OS-3	OS-4	OS-5
R.I. Pollutant Discharge Elimination System (RIPDES) R.I.G.L. 46-12, 42-17.1, 42-35					Y	Y	Y	Y	Y	Y	Y	Y	
R.I. Pretreatment Regulations R.I.G.L. 46-12,42-17.1, 42-45					Y	Y		Y	Y		Y	Y	
R.I. Air Pollution Control Regulations:													
No.1 Visable Emissions	Y				Y			Y					
No.5 Fugitive Dust					Y	Y	Y	Y	Y	Y	Y	Y	
No.7 Emission of Air Contaminants Detrimental to Person or Property	Y				Y	Y		Y					
No.9 Approval to Construct, Install, Modify, or Operate	Y				Y	Y		Y					
No.14 Record Keeping and Reporting	Y				Y	Y		Y					
No.15 Control of Organic Solvent Emissions													
No.16 Operation of Air Pollution Control Systems	Y				Y	Y		Y					
No.17 Odors					Y	Y		Y	Y				
No.22 Air Toxics	Y				Y	Y		Y					
Division of Air and Hazardous Materials Policy on Permitting Air Strippers, April 20, 1989	Y												

TABLE 15

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION I

J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203-2211

ADDENDUM TO THE FEASIBILITY STUDY REPORT FOR THE STAMINA MILLS SUPERFUND SITE, NORTH SMITHFIELD, RHODE ISLAND

Lloyd Selbst
Office of Regional Counsel
USEPA, Region I

July 10, 1990

In addition to the ARARs discussed in the text and tables in sections 4 and 5 of the Feasibility Study, the following are ARARs for remedial alternatives at the Site:

- The Rhode Island Pollutant Discharge Elimination System (RIPDES) requirements are applicable to GW-1, GW-2, and GW-4.
- The Rhode Island analogues of the RCRA facility requirements at 40 CFR Part 264, Subparts B, C, and D are applicable to OS-3, OS-4, and LA-3.
- The Rhode Island analogues of the the RCRA groundwater monitoring requirements at 40 CFR Part 264, Subpart F are applicable to GW-1, GW-2, and GW-4; they are relevant and appropriate to GW-5.
- The Rhode Island analogues of the RCRA location requirements at 40 CFR 264.18(c) are applicable to OS-3 and OS-4; they are relevant and appropriate to LA-3.
- The Rhode Island analogues of the RCRA treatment requirements at 40 CFR Subparts O and X are applicable to GW-1, GW-2, and TSA-3. They are also an ARAR for OS-3.
- The Rhode Island analogues of the RCRA storage requirements at 40 CFR Part 264, Subparts I, J, and L are applicable to GW-1, GW-2, and TSA-3. They are also an ARAR for OS-3.
- The National Pollution Discharge Elimination System requirements are applicable to GW-1, GW-2, and GW-4.
- The Rhode Island Pretreatment Regulations are applicable to GW-1, GW-2, and GW-4.
- The Occupational Safety and Health Standards at 29 CFR Part 1926 are applicable to GW-5 and OS-5.

The following laws were incorrectly described in the Feasibilty Study as ARARs:

- The RIPDES requirements are not ARARs for TSA-3 or LA-5.
- The Rhode Island Pretreatment Regulations are not ARARs for TSA-3.

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APPENDIX C

RESPONSIVENESS SUMMARY

United States
Environmental Protection Agency
Region I

S U P E R F U N D

Responsiveness Summary
Stamina Mills Site
North Smithfield, Rhode Island

September 1990

Table of Contents

Preface

The U.S. Environmental Protection Agency (EPA) held a 30-day comment period from 11 July 1990 to 9 August 1990 to provide an opportunity for interested parties to comment on the Feasibility Study (FS) and the proposed plan prepared for the Stamina Mills Superfund Site (the Site) in North Smithfield, Rhode Island. The FS examined and evaluated various options, called remedial alternatives, to address each area of contamination at the Site. EPA identified its preferred alternative for addressing each area of Site contamination in the Proposed Plan issued July 10, 1990, before the start of the public comment period.

The purpose of this Responsiveness Summary is to document EPA responses to the questions and comments raised during the public comment period on the FS and Proposed Plan. EPA considered all of these questions and comments before selecting a final remedial alternative to address the contamination at the Stamina Mills site.

This Responsiveness Summary is organized in the following sections:

I. *Overview of Remedial Alternatives Considered in The Feasibility Study, Including the Preferred Alternative* — This section briefly outlines the remedial alternatives evaluated in the Feasibility Study and the Proposed Plan, including EPA's preferred alternative.

II. *Background on Community Involvement and Concerns* — This section provides a brief history of community interests and concerns regarding the Site.

III. *Summary of Comments Received During the Public Comment Period and EPA Responses* — This section summarizes and provides EPA responses to the oral and written comments received from the public during the public comment period. In Part I, the comments received from citizens are presented. In Part II, comments from the state are organized by subject. Part III summarizes comments received from PRPs.

IV. *Remaining Concerns* — This section describes issues that may continue to be of concern to the community during the design and implementation of EPA's selected remedy for the Site. EPA will address these concerns during the Remedial Design and Remedial Action (RD/RA) phase of the cleanup process.

In addition, two attachments are included in this Responsiveness Summary. Attachment A provides a list of the community participation activities that EPA has conducted to date at the Site. Attachment B contains a copy of the transcript from the informal public hearing held on 31 July, 1990.

I. Overview of Remedial Alternatives Considered in the Feasibility Study, Including the Preferred Alternative

Contamination at the Site is divided into four areas: 1) trichloroethylene (TCE) spill area, 2) landfill area, 3) groundwater, and 4) overall Site. Using information gathered during the Remedial Investigation, EPA identified specific cleanup objectives for each area of the Site that will be protective of public health and the environment. The remedial alternative selected for the Site must achieve EPA's cleanup levels for soil and groundwater and achieve EPA's goal of eliminating physical and chemical risks to public health and the environment.

In the Feasibility Study (FS) EPA has screened and evaluated several potential cleanup alternatives for each area of contamination at the Stamina Mills site. Additional information on each of the remedial alternatives can be found in the Record of Decision (ROD), copies of which are located in the North Smithfield Public Library at 20 Main Street, in North Smithfield, Rhode Island (the information repository that EPA has established for the Site), and the EPA Records Center at 90 Canal Street in Boston, Massachusetts. The treatment alternatives are described briefly below by contamination area.

TCE Spill Area (TSA)

- *TSA-1: On-site Incineration.* Soils in the TCE spill area would be excavated and incinerated in a rotary kiln incinerator that would be constructed on-site specifically to treat contaminants from the Stamina Mills site. All air emissions from the incinerator would be treated to ensure that air quality standards are met and that public health and the environment are protected. Because incineration may not destroy all contaminants, ash resulting from the incineration process would be tested and disposed of in compliance with state and federal regulations.

- *TSA-3: Soil Vacuum Extraction.* TCE and related compounds would be removed by installing a number of shallow wells throughout the spill area soils. A pump attached to the wells would extract air containing TCE from the soil by creating a vacuum. The air would be collected through one central pipe and the TCE and other volatile organic compounds (VOCs) would be captured on activated carbon filters. The treated air would then be released to the atmosphere and the spent activated carbon filters would be transported off-site for treatment and disposal.

  In the Proposed Plan issued prior to the public comment period, EPA recommended this alternative as its preferred remedy for addressing the TCE spill area contamination.

- *TSA-4: No-Action.* No treatment of TCE spill area soils would be conducted. Instead, the area would be graded to encourage surface run-off, covered with clean fill, and seeded with grass.

Landfill Area (LA)

- *LA-1: On-Site Incineration.* Soil and waste in the landfill area would be excavated and incinerated to destroy the contaminants. Incinerator emissions would be treated prior to release to the atmosphere. Incinerator ash would be tested for residual contamination and disposed of in compliance with state and federal regulations.

- *LA-3: Capping.* Landfill area contamination would be treated by constructing an impermeable cap over the landfill area to prevent rainwater and snow melt from reaching the wastes and contaminating groundwater and surface water. Landfill wastes located in the floodplain would be excavated and placed under the landfill cap. A leachate collection system would also be installed, and any leachate collected would be piped to the existing on-site sewer for treatment at the Woonsocket wastewater treatment plant.

  In the Proposed Plan issued prior to the public comment period, EPA recommended this alternative as its preferred remedy for addressing the Landfill Area contamination.

- *LA-5: No-Action.* The landfill area would be graded, covered with clean fill, and planted to stabilize the area.

Groundwater

- *GW-1: Air Stripping.* Groundwater would be extracted through bedrock wells and pumped to the top of an air stripping tower, where contaminants would be transferred from the groundwater into air being forced up through the tower. Both the contaminated air stream and the treated groundwater would be further treated by passing them through separate activated carbon filters to prevent the emission of contaminants into the air and remove residual contamination in the groundwater. Spent carbon would be transported off-site for treatment and disposal.

- *GW-2: Carbon Treatment.* Groundwater would be extracted through bedrock wells and pumped through a series of tanks containing activated carbon. Contaminants would be adsorbed onto the activated carbon and removed from the groundwater. Spent carbon would be transported off-site for treatment and disposal.

- *GW-4: Ultraviolet Light (UV) and Hydrogen Peroxide.* Contaminated groundwater would be extracted through bedrock wells and treated on-site using a UV and hydrogen peroxide system. EPA will monitor system performance and make an evaluation of the performance of the system annually to determine the effectiveness of extracting and treating the contaminated bedrock groundwater.

In the Proposed Plan issued prior to the public comment period, EPA recommended this alternative as its preferred remedy for addressing the groundwater contamination.

- *GW-5: No-Action.* No groundwater treatment would be conducted. Groundwater would be sampled annually to determine the remaining level of contamination and to define the extent of the contaminant plume. Institutional controls would be implemented to limit future use of the Site and groundwater.

Overall Site (OS)

- *OS-3: Demolition, Sealing Raceways, Location and Removal of Septic Tank Contents, Site Grading.* On-site structures including the mill building ruins and the smokestack would be demolished and disposed of in accordance with Rhode Island Solid Waste Regulations. The entrance and exits of the old and new raceways would be sealed with concrete, and then the raceways would be backfilled with building debris from the Site or other suitable fill material. The septic tank would be located and its contents tested and disposed of off-site. The overall Site would be graded (except for the capped landfill area) and planted with vegetation. In addition, institutional controls in the form of future land use restrictions would be placed over the entire Site.

  In the Proposed Plan issued prior to the public comment period, EPA recommended this alternative as its preferred remedy for addressing the overall Site contamination.

- *OS-4: Demolition, Excavating and Sealing Raceways, Location and Removal of Septic Tank Contents, Site Grading, Excavation of PAHs.* This alternative is identical to alternative OS-3, with the addition of excavation of raceway sediments and excavation of an area of elevated PAH concentrations referred to as the "hot spot". Excavated sediments would be treated and disposed of off-site.

- *OS-5: No-Action.* The Site would be left in its current state. Institutional controls to limit land and groundwater use and tighter Site security measures in terms of improved fencing would be implemented.

II. Background on Community Involvement and Concerns

The 5-acre Stamina Mills Superfund site is located in the Village of Forestdale, within the Town of North Smithfield, Rhode Island, approximately 1 mile south of the Rhode Island/ Massachusetts border and 14 miles northwest of Providence, Rhode Island. Between 1824 and 1975, the Stamina Mills site operated as a textile weaving and finishing facility. A major fire at the Site destroyed the mill complex in 1977, and

the debris-strewn Site was abandoned. Rubble, piles of debris, and foundation remains (including a deteriorating smokestack), currently occupy the Site. Waste disposal practices at the Site included use of an on-site landfill, which is believed to have contributed to site-related contamination problems.

Shortly after a new solvent-based scouring system was installed in 1969, a spill of the solvent TCE occurred during the filling of an above ground storage tank. The area where the spill occurred is referred to as the "TCE spill area". Based on the advice of the Rhode Island Department of Health (RIDOH), the Stamina Mills Company discontinued use of its well as a drinking water source.

During a statewide groundwater survey conducted by RIDOH in 1979, TCE was detected off-site in the Forestdale Water Association well, a community water system located north of the Site and serving approximately 25 homes. As a result of these findings, RIDOH expanded the sampling program and tested 51 private residential wells in the Forestdale area, the Forestdale Water Association well, and the Stamina Mills well. RIDOH found TCE in 18 residential wells. At that time, RIDOH advised area residents to boil water used for drinking and cooking.

In 1981, the State of Rhode Island Water Resources Board and the Town of North Smithfield financed the construction of a municipal water main to serve the residential area north of the Site that had been affected or had the potential to be affected by contamination from the Site. Between 1981 and 1984, only seven of approximately 50 affected or potentially affected residences had connected to the new municipal water supply, reportedly due to costs associated with connecting to the water main.

In 1983, the Stamina Mills Site was placed on EPA's Final National Priorities List making it eligible for Federal cleanup funds. In September 1984, EPA began to supply bottled water to residents not connected to the municipal water supply. Later that year EPA funded an extension of the existing water line as well as the costs for the connection of homes to the municipal water supply. All affected or potentially affected residences are now receiving municipal water.

Community interest in the Stamina Mills site has been moderate during the FS and public comment period. Approximately 20 residents attended a public informational meeting held on 10 July 1990 by EPA. The principal community concerns expressed at that meeting are summarized below.

- *Operation of EPA's Preferred Alternative.* Residents' major concerns included the impact of the remediation on the aquifer, the discharge of the treated water, and the effectiveness of the treatment technologies proposed.

- *Selection of the Remedial Alternative.* Residents questioned why EPA had not included removal of the landfill contents in the preferred alternative, whether PRPs would have input into the final selection process, and whether comments from the state would be published.

- *Project Schedule.* Residents were concerned with the amount of time taken by the cleanup process and the schedule for the start and the completion of the Site remediation.

- *Financing of the Cleanup.* Residents were concerned over who would pay the cost of cleanup and whether the town would bear any of the cost.

- *Final Disposition of Stamina Mills Property.* Residents were concerned over the potential long-term uses of the property and who would control the Site's future development.

- *Groundwater Quality.* Residents were concerned over the possibility of homeowners in the contaminant plume reactivating their wells, whether these homeowners could ever use their wells again, and whether homeowners could recover costs associated with the loss of their wells from potentially responsible parties (PRPs).

III. Summary of Comments Received During the Public Comment Period and EPA Responses

This Responsiveness Summary addresses the comments received by EPA during the public comment period concerning the FS and EPA's Proposed Plan for the Stamina Mills site. Two sets of written comments were received during the public comment period (11 July 1990 - 9 August 1990), one from the Rhode Island Department of Environmental Management and one from the Kayser-Roth Corporation, a named PRP. Five persons submitted oral comments at the informal public hearing. The individuals commenting at the public hearing were either government officials or representatives of the PRPs. A copy of the public hearing transcript is included as Attachment B. Copies are also available at the North Smithfield Public Library at 20 Main Street, Slatersville, Rhode Island, and at the EPA Records Center at 90 Canal Street in Boston, Massachusetts, as part of EPA's Administrative Record for the Site.

Part I — Citizen Comments

Commentors at the public hearing were Senator Paul Kelly and North Smithfield Town Councilor Lynda Masnyk. No written comments were submitted from the general public.

Comment #1: Senator Kelly stated that a principal concern of area homeowners is that EPA, RIDEM, or the Town of North Smithfield take steps to ensure that homeowners whose wells were affected by the contamination plume will not reactivate their wells and potentially cause the plume to begin again to move away from the Site.

EPA Response: EPA's authority under CERCLA does not allow EPA to prohibit the use of private wells that are located off-site. EPA does, however, strongly recommend that wells previously identified as contaminated by the Stamina Site not be reactivated.

Comment #2: Senator Kelly asked EPA or RIDEM to address whether residents who had lost the use of their wells due to Site related contamination had any legal rights by which they could recover their financial losses, and whether EPA or RIDEM could assist them in any effort to recover such losses.

EPA Response: EPA is not authorized to counsel individuals about their private rights of recovery against PRPs. EPA can assist residents by providing information requested by residents that is contained in EPA's Administrative Record for the Stamina Mills Site.

Comment #3: Councilor Masnyk stated that, while she agrees that the preferred alternative would meet EPA's goals for the Site, she would like the Site returned to a pristine condition. She stated that this would require the removal rather than the capping of the landfill contents.

EPA Response: EPA believes that removing the landfill wastes from the Site would not be protective of human health and the environment because of the short-term risks posed by air emissions during the materials handling and operational phases and would not provide a degree of protectiveness proportionate to its cost. The excavation of landfill wastes would only transfer these wastes to another facility and location which would require similar containment and monitoring as proposed for the Site. Therefore, EPA has selected capping of the landfill as the landfill remedy because it limits the extent of short-term risks, it is more cost-effective and it is protective of human health and the environment.

Comment #4: Councilor Masnyk urged EPA to proceed toward a total cleanup of the aquifer, noting that the Branch River groundwater aquifer is considered a potential water supply for the Town of North Smithfield. She also requested that the groundwater quality be monitored as the cleanup progresses.

EPA Response: EPA's goal is to return the groundwater within the contaminant plume to its beneficial use (drinking water quality) as rapidly as technically practicable. EPA will monitor the groundwater quality during the cleanup process to assess the performance of the cleanup system in reaching the drinking water quality goal.

Comment #5: Councilor Masnyk stated that the existing Site condition constituted an eyesore. She requested that the buildings be torn down and the Site's appearance improved as quickly as possible, preferably in less than the two years that EPA estimated it would take to begin remediation work at the Site.

EPA Response: As part of the overall remedy for the Stamina Mills Site, the buildings will be torn down. EPA will pursue the implementation of the remedy within the shortest possible time frame. Also, during the design of the remedy EPA will consider the feasibility and necessity of demolishing the structures first. Because of the potential negotiations with the responsible party, EPA is unable to predict with any accuracy when Site remediation may begin.

Part II — State Comments

The Rhode Island Department of Environmental Management (RIDEM) provided oral comments at the public hearing and written comments in a letter from James Fester, Assistant Director for Regulation, dated 31 July 1990.

Comments Regarding Groundwater Remediation

Comment 1: RIDEM stated that the ROD should: 1) include a performance review of the groundwater remediation to be conducted within five years of the initiation of the remedy, 2) specify an alternative or contingent remedy to be implemented if the performance review indicates that the groundwater remedy is not making satisfactory progress towards meeting the remedial objective, and 3) state that the remedial objective is interim in nature and may be contingent on the result of the performance review.

EPA Response: EPA will conduct periodic review and evaluation of the groundwater extraction and treatment system to determine the cleanup system's contaminant removal efficiency. A complete evaluation of the system will be made within five years of the start up of the extraction and treatment system. If the evaluation reveals that the remedy cannot achieve the stated cleanup levels, or that the cleanup levels cannot be achieved in a reasonable time frame, consideration will be given to making changes in the remedy. The remedy selected in this Record of Decision is meant to be a permanent and complete groundwater cleanup remedy. EPA realizes that the groundwater pump and treat system may not be able to achieve the final increment of the cleanup goals in the estimated time frame (10-15 years). In recognition of the system limitations, EPA will conduct periodic evaluations of the system performance as described above.

Comment 2: RIDEM stated that the groundwater remedy should be implemented in a staged process that defines the parameters needed to optimize the operation of the system as more information becomes available. During the design phase and pump test, the number, locations, pumping rates, and construction specifications of the extraction wells should be chosen to achieve cleanup objectives as quickly as is technically practicable, preferably in less than 10 years.

EPA Response: EPA is in agreement with this comment. EPA intends to use the information generated during the pre-design, design and operational phases of the system to optimize the efficiency of the extraction system. The goal will be to achieve the cleanup objectives as rapidly as technically practicable.

Comment 3: RIDEM questioned the ability and appropriateness of leaching galleys to discharge effluent at the proposed rates of extraction.

EPA Response: The results of the pre-design pump test and pilot testing of the groundwater treatment system will be used to evaluate the appropriateness and/or feasibility of the three discharge options being considered by EPA for the treated groundwater. The options being considered include subsurface disposal through on-site leaching galleries, on-site surface water discharge, and discharge to an on-site sewer line with off-site treatment at the Woonsocket publicly owned treatment works

(POTW). During the FS, the on-site subsurface discharge using leaching galleys was selected as the initial disposal option, but EPA believes at this time that the on-site surface water discharge may be the most appropriate and feasible alternative. The final decision on which disposal option will be used for treated groundwater will be made during the design stage using information obtained during pre-design activities.

Comment 4: RIDEM questioned the exclusion of metals treatment in the FS and Proposed Plan given the occurrence of metals in concentrations above MCLs.

EPA Response: Chromium was detected in 2 out of 32 on-site monitoring wells at concentrations above the MCL. The occurrence of chromium in these two wells, which are in the vicinity of the landfill, is believed to be associated with the migration of landfill leachate. The proposed remediation of the landfill includes capping and collection and treatment of leachate from the landfill. The proposed remedy is designed to mitigate the further migration of chromium into the Branch River and groundwater. Chromium levels above the MCL have not been detected in any other monitoring wells across the Site. Therefore, a separate treatment system for the removal of chromium from the groundwater is not believed to be required for remediation of the Site. One other trace metal, lead, has been detected at concentrations slightly exceeding MCLs in the groundwater from scattered locations across the Site. It is not anticipated that the concentrations of lead or chromium in groundwater extracted for treatment will increase or exceed MCLs during the operational period of the groundwater extraction and treatment system. Rather, these concentrations are expected to decrease during extraction as a result of the reduction in leachate generation due to the RCRA capping and installation of a leachate collection system in the landfill and the natural dilution that will occur as groundwater from the entire Site is extracted. Further monitoring of the levels of metals found in the groundwater will be conducted during pre-design. In the event that the monitoring indicates the need for additional pretreatment of metals, either to meet groundwater cleanup ARARs or disposal ARARs for treated groundwater, then further laboratory bench-scale or pilot testing will be completed during pre-design and design phases.

Comment 5: RIDEM asked whether the potential for added treatment of groundwater prior to discharge had been considered in the evaluation of the groundwater treatment alternatives.

EPA Response: As described in EPA's response to Comment 4, above, pretreatment for soluble metal ions is not anticipated to be needed at this time. Monitoring of the groundwater for soluble metal ions will be completed during the pre-design pump test and pilot testing of the UV/hydrogen peroxide system. In the event that the monitoring indicates the need for further pretreatment of soluble metals, either to meet groundwater cleanup ARARs or disposal ARARs for treated groundwater, additional laboratory bench-scale or pilot testing will be completed during pre-design and design phases.

Comment 6: RIDEM asked whether the costs of installing and operating the proposed pressure filtration unit and the iron and manganese removal units had been included in the cost estimates for each groundwater alternative, and if not, what these added costs would be.

EPA Response: Costs for iron and manganese removal using a pressurized filtration system were included in all of the groundwater treatment alternatives evaluated. Further pre- or post-treatment requirements will be determined during the pre-design and design stages for the final remedial alternative. Significant cost differences between the alternatives for groundwater treatment would not result from the additional treatment, nor would the overall cost be significantly altered given the available information.

Comment 7: RIDEM questioned whether the UV/hydrogen peroxide oxidation system would affect the dissolved metals found in the Site groundwater. RIDEM specifically questioned whether trivalent chromium would be oxidized to hexavalent chromium.

EPA Response: EPA discussions with the designers of the UV/hydrogen peroxide system indicate that the system would have little effect on dissolved metals in the groundwater. Specifically, trivalent chromium would not be oxidized to hexavalent chromium during the treatment process. Also, EPA believes that the chromium detected in the monitoring wells in the vicinity of the landfill is associated with leachate migration from the landfill and is not reflective of levels that would be found in extracted groundwater. The remediation of the landfill should effectively eliminate any further migration of chromium into the groundwater and the Branch River.

Comment 8: RIDEM questioned how EPA will address the potential for drawing contaminated groundwater during the Site pump test from sources other than Stamina Mills.

EPA Response: The pre-design pumping test will be designed to gather the information necessary for designing and evaluating the recovery system which includes delineating the draw down distribution and the capture zones. The recovery system will be designed to minimize the extraction of clean groundwater and any induced infiltration from the Branch River. The design also will seek to minimize the potential for causing the migration of any contaminants from off-site areas such as the industrial area south of the Branch River. This will be done by evaluating the predicted draw down distribution. Monitoring of well water levels will also be conducted during operation of the recovery system to verify that capture zones are being maintained to minimize the infiltration of water from outside of the capture zone.

Comments Regarding the Landfill

Comment 9: RIDEM questioned whether the leachate collection system discharge would be continuous or in batches.

EPA Response: Because of the difficulty in predicting the precise effects of a RCRA cap on the quantity and physical characteristics of any leachate that would be generated, it is likely that the initial quantities of leachate generated, after the construction of the cap, will be collected, tested, stored on-site, and treated if necessary, until it has been established that the leachate will meet pre-treatment requirements of the POTW. Therefore, the initial discharge from the leachate collection system is likely to be in a batch mode but this may be changed to a

continuous discharge at a later date, pending the characterization of the landfill leachate.

Comment 10: RIDEM questioned what measures will be necessary to prevent infiltration from the river during flood conditions.

EPA Response: The construction of the cap and the nature of the capping material (40 mil high-density polyethylene) will minimize infiltration of water from precipitation and/or any possible flood waters. Much of the landfill material within the 100-year flood plain will be excavated and rip-rap will be placed on top of the cap in the flood plain areas to provide scouring protection during flooding.

Comment 11: RIDEM questioned whether EPA is proposing to limit access to the sewer line under the landfill for maintenance or replacement of the line and thereby protect the integrity of the cap.

EPA Response: EPA proposes to allow access to the manholes currently existing in the landfill by including in the cap design provisions to extend the manholes to the new surface of the cap. The manholes would allow access to the line for repairs in the future. The remedy must remain protective; therefore, the integrity of the cap must not be impaired by any work performed by the Town on the sewerline.

Comment 12: RIDEM questioned why the feasibility of excavating the landfill was not evaluated in-depth other than in the off-site incinerator alternative.

EPA Response: The alternative for excavation and removal of landfill wastes to an off-site facility did not receive detailed analysis because it was determined by EPA to not be protective of human health and the environment because of the short-term risks posed by air emissions during the materials handling and operational phases and would not provide a degree of protectiveness proportional to its cost. The excavation of landfill wastes would only transfer these wastes to another facility and location which would require similar containment and monitoring as proposed for the Site.

Comments Regarding the Overall Site

Comment 13: RIDEM asked whether EPA had developed contingency plans to address any areas of the raceways found to be intact during remediation.

EPA Response: The exits of the old and new raceways will be sealed with concrete and then the raceways will be backfilled with suitable fill material. Site investigations indicate that the raceway beneath the landfill has collapsed. Further test pit activity during the design phase of remediation will be necessary to determine the integrity of the raceways. Procedures for filling the sections of the raceways that are found to be intact will be developed during design and implemented during construction.

Comment 14: RIDEM stated that EPA's references to coal gasification operations at the Site are inappropriate, given that semi-volatile contaminants found in an area referenced as a "gasometer" are not consistent with coal gasification operations.

EPA Response: EPA's references to coal gasification operations at the Site are based upon the 1899 plan of the Stamina Mills (Forestdale Manufacturing Company) (Site Plan SP-1 of the RI) which shows the location of a 34' diameter, one-story stone "gasometer". The plan shows the gasometer to be located near the banks of the Branch River between the raceway inlet and the extension of Mill Building No. 1. A 6' x 16' coal shed is also indicated on the plan. The type of compounds detected in this area, polycyclic aromatic hydrocarbons (PAHs), are associated with a variety of natural and synthetic processes, one of which is coal gasification. EPA agrees with RIDEM that the levels of PAHs detected in the area near the former gasometer are lower than those typically associated with a coal gasification facility. The lower levels seen in this area may be the result of the fire which took place in 1977 or some other site-related activity. In addition, other compounds which are typically found associated with a coal gasification facility, such as iron, and whose presence at elevated levels are used to confirm a coal gasification operation, were not detected in this area.

Comment 15: RIDEM suggested that grouting of the sewer line trench could significantly limit contaminant migration along the trench and would enhance the effectiveness of the groundwater remedy for the bedrock aquifer.

EPA Response: Grouting of the sewerline trench may limit contaminant migration along the trench. However, EPA believes a more effective way of limiting this migration pathway would be by maintaining groundwater levels below the bottom of the trench. Groundwater elevations are expected to be lowered as a result of the operation of the groundwater extraction system. During the pre-design and design phases, the use of the groundwater extraction system will be considered to help eliminate the sewerline trench as a potential migration pathway.

Comment 16: RIDEM asked whether the installation of physical barriers at the points where raceways enter and exit the landfill had been evaluated.

EPA Response: EPA has evaluated the installation of physical barriers at the entrance and exits of the raceways. These locations will be sealed using a concrete barrier and areas of the raceways which are not already collapsed will be back filled with suitable fill material. EPA believes that these remedial activities along with the landfill cap construction will minimize the migration of ground and surface water into the landfill. The construction of an additional concrete barrier in the old raceway, directly upgradient of the landfill will also be considered as a means of reducing the flow of water through the landfill in the event that there is evidence of a continued flow through the old raceway after the raceway entrance has been sealed.

Comments Regarding the TCE Spill Area

Comment 17: RIDEM questioned whether a lowered groundwater table resulting from the operation of the groundwater extraction system would allow placement of the vent systems so that the entire overburden in the TCE spill area could be treated.

EPA Response: Measurements taken during the remedial investigation indicate that only a small zone of seasonally saturated overburden soils exist at the Site (approximately the lower 2 feet of the overburden). The cone of depression which will

ultimately result from the pumping of groundwater from the bedrock aquifer at the Site will likely cause the groundwater found in overburden soils to be lowered. The wells installed as part of the vacuum extraction system would be placed above the bedrock surface and the seasonally saturated overburden to insure that they are above any possible saturated conditions. Should this 2' zone become dewatered, the zone of influence for the extraction system, as proposed, would likely remove VOCs from the entire overburden soils including the lower few feet.

Comment 18: RIDEM questioned what is the maximum time expected to meet the objectives for the TCE spill area given the expected decrease in contaminant removal rates and the possibility of pulsed flow in the venting system.

EPA Response: It is estimated that it will take approximately one year to achieve the soil cleanup levels in the TCE spill area using the soil venting system. Monitoring of the system's performance during the operational period will demonstrate the effectiveness of the vacuum extraction system in achieving the cleanup goals and the need, if any, for extending the period of operation. It is anticipated that initially during the cleanup period the soil venting system would be operated on a continuous basis. As cleanup levels in the soil are approached, it may be more effective to change to an intermittent type of operation to allow for the equilibration of soil and air-pore concentrations. The estimate of one year is believed to reflect, at present, EPA's best estimate for the total time to achieve cleanup assuming both a continuous and intermittent operation of the soil venting system. Further refinement of the cleanup time would only be available after the operation of the system had been initiated and field data was available.

Comments Regarding Applicable or Relevant and Appropriate Requirements

Comment 19: In discussions of the overall Site remedy the Rhode Island Rules and Regulations for Solid Waste Management Facilities are not consistently referenced. These regulations will govern the sorting and disposal of the building debris during this stage of the remedy. RIDEM asked if the extensive sorting and characterization operations anticipated at the Site were considered in the estimates of the costs for the overall Site clean-up alternatives

EPA Response: The sorting and separating of building debris were considered during the preparation for cost estimates for the overall Site remedy.

Comment 20: RIDEM stated that EPA should reference EPA surface water discharge limitations on total residual chlorine when evaluating compliance.

EPA Response: Information available from the designers of the UV/hydrogen peroxide treatment system indicates that very small amounts of free chloride ions are generated during the treatment process which likely go on to form simple salts. The vendor has indicated that no residual chlorine is produced by the process. Therefore, residual chlorine levels in the effluent from the groundwater treatment unit are not expected to change for levels found in the influent. Any discharges from the system to surface waters will meet all applicable discharge limitations.

Comments Regarding Operation and Maintenance Responsibilities and Costs

Comment 21: RIDEM questioned the scope and breadth of long-term sampling, inspection, and maintenance programs for the Site and the cost estimates for those programs.

EPA Response: The costs associated with operation and maintenance, which include sampling, inspection, and other maintenance activities, and which are presented in the Feasibility Study are preliminary in nature and will be refined during the remedial design phase. The costs and costing procedures were developed from the selected references tabulated on the last page of Appendix C to the Feasibility Study. Annual O&M cost and present worth O&M cost are enumerated in Appendix C, along with sample calculations. The cost estimating assumptions are listed in the Basic Column of each table in Appendix C. For example, quarterly monitoring is assumed and groundwater monitoring sampling parameters included the target compound list for volatile organic compounds, the target analyte list for metals, dieldrin, pH, temperature, specific conductance, and chlorides. The O&M contingency costs for each alternative were assumed to be 1 percent of the capitol cost. Equipment, labor and material cost estimates are detailed in Appendix C.

Comment 22: RIDEM questioned what type of insurance would be necessary and/or is planned for the remedial activities.

EPA Response: In general, the contractor should procure and maintain the following types of insurance:

- Workmen's compensation insurance in amounts to satisfy State law;
- Comprehensive general liability insurance for bodily injury, death or loss of or damage to property of third persons in the minimum amount at $1,000,000 per occurrence.

Subject to certain restrictions, Section 119 of the Superfund Amendments and Reauthorization Act of 1986, authorizes EPA to provide indemnification to response action contractors working at Superfund sites for EPA, States and potentially responsible parties. Response action contractors must demonstrate to EPA that they have made diligent efforts to obtain insurance coverage from non-Federal sources to cover pollution liability before they can receive Federal indemnification.

Comment 23: RIDEM asked what degree of project management is anticipated and noted that the cost estimated for project management by EPA seems high.

EPA Response: EPA anticipates that during construction and startup of the remedy, day to day on-site project management by EPA's oversight contractor or principal contractor will be necessary. The cost estimated for project management is appropriate for the cost comparisons conducted during the Feasibility Study and falls below the average annual oversight cost for remedial design and construction projects conducted in Region I.

Comments Regarding Future Use of the Site

Comment 24: RIDEM questioned the extent to which the future use of the Stamina Mills property would be restricted, and what specific administrative controls were envisioned for the Site and/or surrounding area.

EPA Response: Institutional controls would be implemented to maintain the overall protection of human health and the environment believed to be afforded by this remedy. EPA has proposed, in a consent decree lodged in Federal Court, institutional controls with the current owner -- Hydro-Manufacturing -- to protect the remedy. It should also be noted that the local government may have the authority to implement and enforce institutional controls such as deed restrictions, notices, and building permit restrictions.

Part III — Summary of Potentially Responsible Party Comments

Kayser-Roth, the principal PRP at the Site, provided written and oral comments which are summarized below:

1. Ex-situ bioremediation was not addressed during the analysis of possible groundwater treatment alternatives. Kayser-Roth recommended that bioremediation be formally analyzed as a treatment alternative.

EPA Response: EPA, consistent with the NCP, developed a limited number of remediation alternatives that would attain site-specific remediation levels for the groundwater response action. Ex-situ bioremediation was not one of the technologies considered in the FS as a potential alternative because it would not attain site-specific remediation levels. Pilot testing completed at other sites has shown that ex-situ bioremediation is not effective in degrading TCE and other chlorinated solvents which were the principal contaminants found in the groundwater plume at the site. In these studies, chlorinated solvents were found to be primarily removed through uncontrolled volatilization rather than through treatment. Recently pilot-scale studies have been completed using a variation of ex-situ biodegradation, in which an anaerobic environment is maintained and a co-substrate is added. This process has been shown to be effective in destroying TCE and other chlorinated solvents through biodegradation for ex-situ and in-situ applications. Because the anaerobic ex-situ bioremediation still requires extensive pilot-work before it would be available for a full-scale operation at the Site, it was not considered for the site.

2. Selection of the UV/peroxide technology for the preferred alternative is based on extremely limited testing. No pilot studies were conducted for pretreatment. No provision for pH adjustment at either the influent or effluent has been made, nor have the costs associated with these adjustments been considered.

EPA Response: Costs estimated for the UV/hydrogen peroxide groundwater treatment system were calculated using the high end of the range of treatment costs provided by the vendor after conducting a treatability study for this purpose. Pilot

testing would be conducted prior to full scale start-up to assure that groundwater ARARs and disposal option ARARs for treated groundwater would be met using the recommended pressure-filtration system for pretreatment. The pilot test would occur during pre-design and would use the UV/hydrogen peroxide system to treat contaminated groundwater generated during the on-site pump test. The costs for pH adjustment were not considered in the total costs estimated for the UV/hydrogen peroxide system because the results of the treatability test, using groundwater from the Site, indicated that the system would meet groundwater cleanup levels in a reasonable time frame without the need for pH adjustment. Cost estimates in the Feasibility Study are judged to be within the +50 percent to -30 percent accuracy range, recommended in EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA/540/G-89/004)* for alternatives under consideration.

3. Preliminary groundwater modeling used to determine groundwater cleanup times may be inaccurate and result in significantly underestimated costs.

EPA Response: A pump test, conducted using a community well system near the Site, indicated that a maximum yield of 10 gallons per minute (gpm) could be obtained from the existing well located in the bedrock aquifer on a long term basis. This flow rate of 10 gpm was used in the preliminary modeling effort to estimate the cleanup time for the groundwater contaminant plume. The groundwater extraction system has been conceptualized to consist of more than one extraction well with combined pumping rates that may exceed 10 gpm. Because of the subsurface conditions existing at the Site and the difficulty they present in obtaining a high groundwater yield over an extended period of time, a short duration-high yield pumping activity, known as pulsed-pumping was also considered for the Site. Using a pulsed-pumping scenario, a combined pumping rate of as high as 40 gpm was considered feasible for the Site for short durations. Therefore, for costing purposes, it was assumed that the treatment system should be designed to handle a potential maximum combined pumping rate, assumed at this stage to be 40 gpm. EPA believes that the information used to estimate the cleanup time frame and the cost of the groundwater extraction and treatment system is reasonable given the information currently available. EPA will update its estimates for cleanup time and cost as more information becomes available upon completing the pre-design pump test.

4. A risk assessment should be undertaken to determine if air discharges from the proposed treatment technologies which have air emissions are in compliance with Applicable or Relevant and Appropriate Requirements before a decision is made on whether to use or not to use control devices.

EPA Response: A risk assessment is not necessary to determine if air emissions will meet the RI ARARS without the use of air emission control devices (e.g., vapor phase activated carbon) because the acceptable limits for air emissions are clearly identified in these regulations and untreated air emissions from an air stripper would exceed them. Calculations for air emissions from an air stripping tower are included in Appendix B of the FS and are based upon the levels at which TCE and other VOCs

found in the groundwater on-site would be discharged to the atmosphere. The discharge levels exceed RI ARARs established to regulate the emissions of these compounds and require the use of some type of control device to reduce discharge levels. An additional State ARAR requires that a "new source" of air emissions use best available control technology (BACT) to control any emissions. As the air stripper would be considered a "new source" it would be required to use BACT which at present time is a vapor phase carbon filter as proposed in the FS.

5. The soil vacuum extraction system proposed for the TCE spill area should be readdressed after pilot study data are available to estimate the operation time required. If a longer operation time is required, more operations and maintenance funds need to be allocated.

EPA Response: Site-specific technical data will be obtained as part of the soil vapor extraction system design. The shake-down operational period of the system prior to full scale operation will better define the estimated time to reach the cleanup goals and help optimize the system. During the time frame the system is to be operated, its performance will be evaluated and the time to achieve cleanup levels will be re-examined as operational data becomes available.

6. All potentially hazardous on-site demolition debris and excavated material should be placed under the cap for the landfill, unless they are subject to the landfill ban, in order to reduce the expenses of off-site transport and disposal.

EPA Response: As suggested in this comment, disposing of rubble and other potentially hazardous materials in the landfill could result in lower disposal costs than off-site disposal. However, the State solid and hazardous waste regulations place limitations on what disposal may take place at the Site. Movement and disposal of the hazardous waste from outside the landfill into the landfill area would constitute designation as a new land disposal facility and would be prohibited under the State hazardous waste regulations. Rhode Island Solid Waste Regulations allow for rubble consisting of materials of an earthen origin (i.e., bricks, concrete) to be disposed of on-site. However, all other non-hazardous debris must be disposed of off-site at a RIDEM approved facility.

7. A higher interest rate than recommended in EPA guidance documents was used for calculating the net present worth of operation and maintenance, thereby resulting in an underestimate of the cost.

EPA Response: The Feasibility Study cost estimates are expected to provide an accuracy of +50 percent to -30 percent and fall within the range recommended in EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA/540/G-89/004)* for alternatives under consideration. Although EPA Guidance dated October 1988, recommends a discount rate of 5 percent, it also notes that a rate of 3 percent to 10 percent may be used to compare alternative costs. EPA in this case followed OMB Circular A-94 as specified in the National Contingency Plan, effective April 9, 1990. OMB Circular A-94 prescribes a standard discount rate of 10

percent which represents an estimate of the average rate of return on private investment before taxes and after inflation. Since the ten percent discount rate was used in the cost estimates for each alternative, the relative estimated costs are appropriate for comparison of alternatives.

8. Conclusions drawn from the results of the aquifer testing were vague and contradictory. No water-level information was obtained from the south side of the Branch River to demonstrate possible hydraulic interconnection. The aquifer test results were used in groundwater modeling for estimating pumping rates and cleanup times. These misleading conclusions may affect the overall cost of the cleanup.

EPA Response: EPA believes that the conclusions drawn from the results of the aquifer test were not vague, contradictory or misleading. EPA also believes the results of the aquifer testing confirm the hydraulic connection between the Site and the residential area to the north of the Site.

For the preliminary evaluation of the remediation system, it was assumed that a continuous pumping rate of 10 gpm or total daily withdrawal of 14,400 gpd would not result in river water being captured by the recovery system and undergoing treatment. A simplified analysis of the potential downgradient stagnation point for a single well pumping at 10 gpm was conducted. This analysis suggested that the capture zone for a well positioned at the location of MW-2 would not extend to the Branch River. The final design and operation of the recovery system will be based on the results and analysis of the pre-design pump test. The system will be designed to maximize the volume of contaminated water extracted and minimize the capture and treatment of clean water, thereby minimizing cleanup times.

IV. Remaining Concerns

Issues raised during the public comment period that will continue to be of concern as the Site moves into the RD/RA phase are listed below. EPA will continue to address these issues as more information becomes available during the RD/RA.

1. The effectiveness of the groundwater monitoring program.
2. Site appearance and future potential use of the Site.
3. Treatment of leachate at the local wastewater treatment plant and potential impacts on the local sewer line on-site.
4. Effectiveness of the remediation and any effects of the remediation on the aquifer.
5. Timing of the start of the remediation and the time to meeting the cleanup goals for the Site.